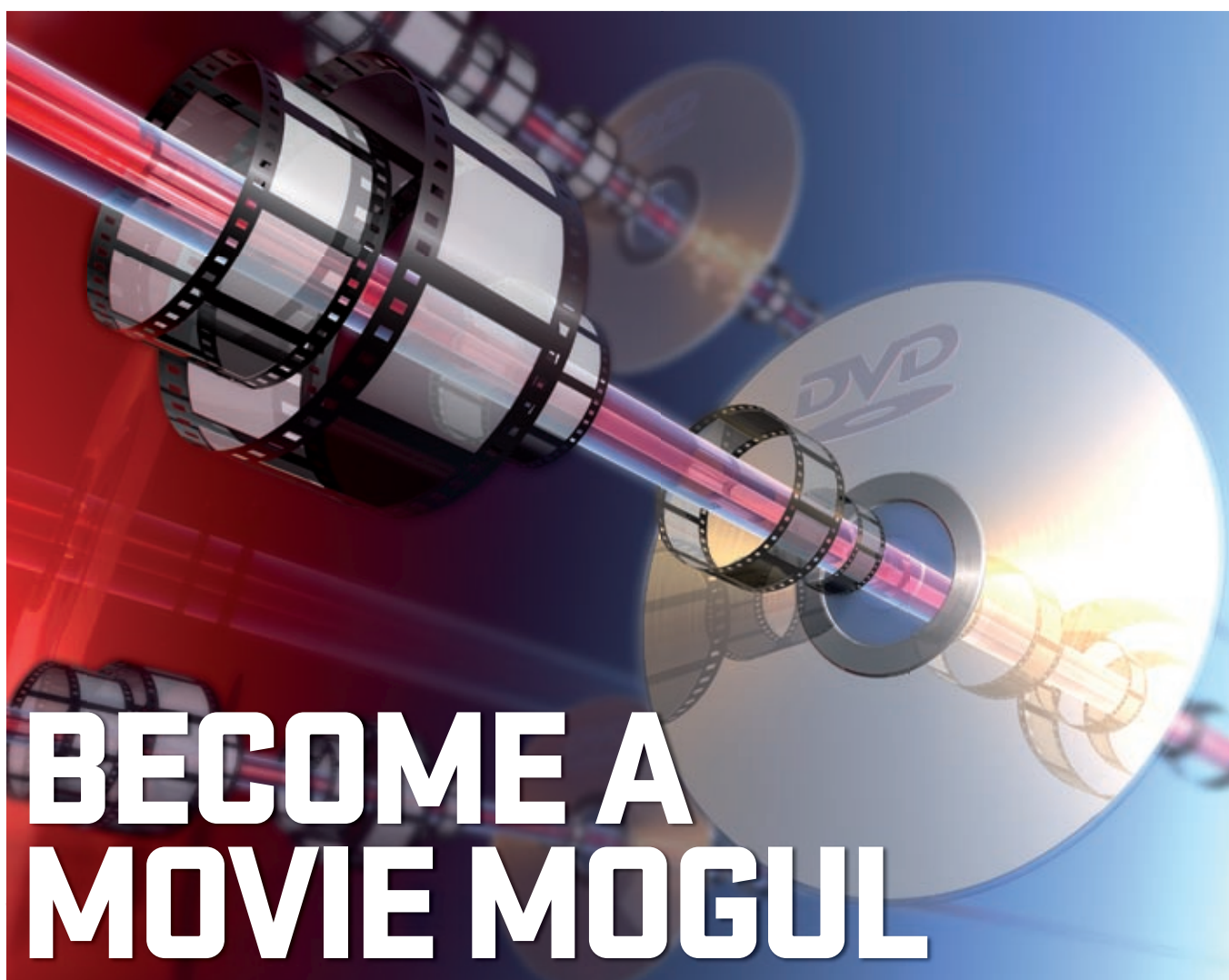




BECOME A MOVIE MOGUL

Are you in awe of the slick graphics and menu effects found on the DVDs of Hollywood movies? Well, you shouldn't be – they're actually very easy to produce. **Ben Pitt** shows you how to create your very own video masterpiece

You can achieve professional results when authoring DVDs at home for less than the cost of a restaurant meal for two. Here we reveal the professionals' secrets and explain the concepts behind creating a sophisticated DVD menu. Together with the right software and our tutorial you'll quickly create DVD projects that stand out from the usual home-made fare.

We've used Sony DVD Architect Studio, which is packed with advanced features and costs just £25 including VAT. This month's cover disc also includes a fully functional 30-day trial of the software.

DISSECTING THE DVD

Menus in commercial DVDs often seem highly complex, but hardware DVD players are simple devices that are capable of only three basic tasks: showing a video stream (or still image), overlaying a static, block-colour bitmap on top, and playing an audio soundtrack.

The bitmap is used for button highlights in menus and for subtitles in the videos, which on a DVD-Video are known as titles. In fact, there's not much difference between a menu and a title. Menus often comprise a video file – which is how animated menus are created – and

titles can include buttons, although this feature is rarely used on commercial discs or supported in non-commercial software.

Video is always encoded in MPEG2 format in either PAL or NTSC video standards, which keeps things simple for the players. The audio requirements are more flexible, and can be in uncompressed PCM (similar to a Wav file), Dolby Digital or MPEG1 Audio Layer II (MP2) format. Some players support DTS soundtracks, but if it's used it must be in addition to one of the three standard formats to maintain full compatibility. For more information on video and audio-encoding options, see the 'It's an enigma' box on page 148.

The overlay image used for subtitles and button highlights is essentially a four-colour static bitmap. These four colours can be picked from a 24-bit colour palette but are fixed for the duration of a menu or title. Four block colours aren't the prettiest things to look at, but each one can be given a level of transparency.

This is how DVD-authoring software achieves what appear to be animated buttons: the animation is built into the background video file, and the semi-transparent highlight shows which button is selected while letting the animated background shine through it.

It's common for one of the four colours to be fully transparent. Otherwise, you'll be limited to rectangular-shaped highlights, which won't look very exciting. It's also common practice to select just one colour as your highlight and let the software use the remaining two to soften the edges of the highlighted areas by using the same colour you selected but with varying degrees of transparency. However, some DVD-authoring software allows the user to define all four colours independently, which makes various different tricks possible.

HERE ARE THE HIGHLIGHTS

We said that the four colours are fixed for each menu or title, but this isn't quite true. When you navigate around a DVD menu, you've probably noticed that, after selecting a button by pressing Enter on your remote control, the highlight changes colour for the second or so that it takes to load the selected menu or title. Sure enough, some DVD-authoring software lets you define an additional four colours for activated buttons. Some also let you define yet another four colours for non-highlighted buttons. This feature is rarely used, probably because adding a splash of colour to both highlighted and non-highlighted buttons can cause confusion during



menu browsing. However, as our tutorial below shows, it's possible to misuse this feature to create full-colour, animated button highlights.

FROM A TO B

Disc-navigation options can be bewildering, which is why most low-cost authoring packages hide them from the user, typically giving a single global option to return to the main menu or continue to the next title after the previous one has finished. Advanced authoring software uses default navigation structures to help inexperienced users get started, but part of their appeal is the ability to define exactly how each menu, button and title behaves.

The diagram on page 148 shows the navigation options available in DVD Architect Studio, plus a few extra ones that are found in more upmarket authoring software. We have divided these options into three groups: those applicable to menus, buttons and titles.

The options for a menu and for a title are pretty similar. The ability to lock specific remote-control buttons is the feature used on commercial DVDs to make copyright notices or adverts you can't skip or fast-forward. In practice, it usually serves only to annoy people, but you may come up with a legitimate use for it.

For each title, you can also specify the destination when the user presses the Menu

button on their remote control. The default setting is the most recent menu, but you may wish to return the user somewhere else, perhaps higher up the menu hierarchy. If you're making a DVD for use in a presentation, you could reprogram the Menu button to provide a quick short cut to a particular menu or title.

An animated menu has a finite length, based on the length of the video file it comprises. Its end action is what happens when playback reaches the end of this file. You can pause, loop back to the beginning or to a specific point in the menu's duration or automatically activate one of the buttons. In a title, the end action can instruct the player to jump to a specific menu or title

HOW TO... Create animated buttons

Use Sony's DVD Architect Studio to produce professional-looking menus

SONY DVD ARCHITECT STUDIO (30-DAY TRIAL)



DVD Architect Studio is far more sophisticated than other low-cost DVD-authoring programs, allowing the user to get down to the nuts and bolts of menu design and disc navigation. In this tutorial, we'll create a menu page with animated buttons, but rather than using the button highlight feature to draw attention to the selected button, we'll use it to hide the other, inactive ones.

This gives a far more dramatic result than conventional animated buttons, where they all remain animated all the time and one is just a bit brighter than the others. We'll also create a short intro sequence for our menu, as the buttons move into view. This would cause problems for other packages, but DVD Architect Studio allows the user to set a loop point, before which time the buttons aren't accessible.

To follow the tutorial, install the 30-day trial of DVD Architect Studio from this month's cover disc. You'll also need video-editing and image-editing software, both of which must support layers. We've also included the MPEG of our Menu background movie clip on the cover disc.

1 Our example project consists of a main movie and a bonus movie, and we also want a scene-selection menu to jump to chapters in the main movie. Launch DVD Architect Studio and import the video files by dragging them from the Explorer panel at the bottom left into the Project Overview panel above it. Double-click on the main movie to open it and double-click on points on the Timeline to create chapters. When you're happy with your chapters, right-click on the movie in the Project Overview panel and select Insert Scene Selection Menu. This generates a menu page with links to each chapter point.

2 The next task is to design your animated menu. You can do this by combining elements within DVD Architect Studio, but you'll achieve much more sophisticated results using video-editing software.

Your design can be as complex or as simple as you like, but the aim here is to create buttons with a static shape and position but lots of internal motion and colour effects. Each button should be designed as you want it to appear when it is selected. It's essential that the buttons don't overlap as we'll need to draw rectangular frames around them. These rectangles mustn't overlap each other, so avoid button shapes with extrusions that overhang each other. Also, keep the buttons away from the edge of the screen, as some TVs crop the image during playback.

In our example we've used four video layers: a gloomy forest background; a swirling, foggy swamp (created with Vegas's Noise Texture media generator combined with Light Rays and Chroma Keyer effects); and two layers of bitmaps created in Photoshop Elements – one for the signposts and another for the text that appears on them. The bitmaps are saved in .psd format with transparent backgrounds so that the swamp and forest are visible underneath. Using two separate bitmap layers makes it possible to apply video effects to the text only. By using keyframes to make the effects' settings morph over time, we can create some internal movement within the button designs.

At the start of the timeline, our signposts bubble up from under the swamp, but from five seconds in they stay in the same place. This will enable us to line up the signposts with our DVD menu buttons, which must have fixed positions. We've also added some suitably eerie music and sound effects to add to the atmosphere. When your video is complete, render it to a single video file in DV AVI or MPEG2 format.

3 Now it's time to design the subdued, non-selected versions of the buttons. You'll need image-editing software to do this, and you'll need to limit your colour palette to three colours. It doesn't matter what these colours are at this point, but it's worth keeping each one on a separate layer for easier manipulation in the next step.

To make sure that your subdued buttons are exactly the right size and shape, import a frame from your video created in Step 2. You can do this in Vegas by selecting Best (Full) in the Monitor window, clicking on the Copy Snapshot to Clipboard button and pasting it into your image editor. If you used bitmaps to create the animation, you can save yourself the bother of tracing around the video frame by simply re-importing them, but remember to limit your design to no more than three block colours.

4 Isolate each button, crop the image to fit and adjust the three colours to white, light grey and dark grey, keeping the background transparent. This allows DVD Architect Studio to identify them correctly.

The easiest way to do this in Photoshop Elements is to duplicate the image (File, Duplicate), delete the background layer, crop around a single button with the Crop tool, then use Hue/Saturation (Enhance, Adjust Color) on each layer, reducing the Saturation to -100 and adjusting the Lightness as necessary to produce white, light grey, dark grey and black or transparent layers. Save each button as a .PSD file.

5 Return to DVD Architect Studio and double-click on the top menu in the Project Overview. By default, this will have 'Menu 1' as its title, so select and delete this text object. In the Properties panel on the right, click on the Background Media tab and the entry labelled Video. Click on the arrow, followed by Replace, and browse to the video file you created in Step 2. If your background video includes audio, repeat the process for the Audio field.

Your DVD menu animation can now be played using the transport controls at the bottom of the screen, but as far as the software is concerned it doesn't yet contain any buttons. Drag the main movie, bonus movie and scene-selection menu from the Project Overview window into the central window on top of their respective button graphics.



(including itself to create a loop), to return to the most recently visited menu or to stop playback. You can also specify which chapter in a title to jump to, or which button is highlighted by default after arriving at a menu.

Buttons can instruct playback to stop, resume from where the user left off in a title or jump to a specific title or menu. You can specify which chapter in a title to jump to or which button to highlight after arriving at a menu. In advanced software that supports multiple soundtracks, video angles and subtitles for each title, buttons can also specify which of these to play. Some applications also allow the user to program an end action into the button, so that it not only

dictates which title to play, but also where to go afterwards. This takes precedence over the end action assigned to the title itself, which is why button end actions are known as overrides.

RIGHT ON THE BUTTON

Buttons have two more options. By default, the user must navigate to a button and press Enter to activate it. However, if a button is set to auto-activate, the user need only navigate to it in order to activate it. Buttons on a menu page are navigated using the up, down, left and right buttons on the remote controls. This is a straightforward procedure when the buttons are arranged in a neat grid, but can become less so

when the buttons are arranged in a haphazard fashion. DVD Architect Studio makes it possible to customise how the buttons join together, as each button has options for where the selection moves to when the user presses the up, down, left and right controls.

DVD Architect Studio also includes a Playlist feature. This is an extension of the end action override concept, and allows titles to be arranged in a variety of orders on the same disc. Once created, a playlist behaves just like an ordinary title, with the titles within behaving like chapters. It provides an easy way to create a Play All button on a disc that otherwise returns to the main menu after each title.



6 By default, buttons in DVD Architect Studio comprise a thumbnail and a text description of the title or menu to which they link. Select each text object and delete it. Select one of the button graphics, click on the Media tab under Button Properties and change Thumbnail Media to the relevant bitmap you created in Step 4. Select the Sizing tool and resize the button so it lines up with the graphic in the background video. You might need to turn off Enable Snapping from the Options menu to allow precise positioning.

Return to Thumbnail Media and select Remove. This creates an invisible button, revealing the button graphic in your background animation. Click on the Highlight tab, and under Style choose Custom. Under Mask, browse to the same bitmap image, and for Mask Mapping, select Intensity. This tells the software to use the

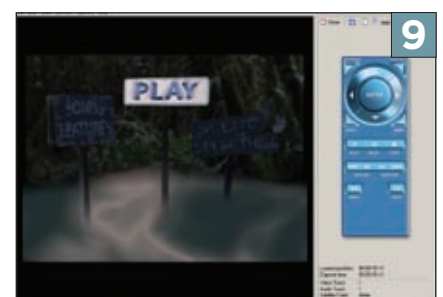
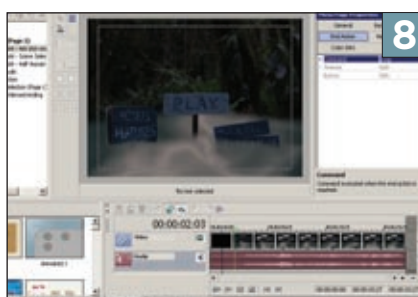
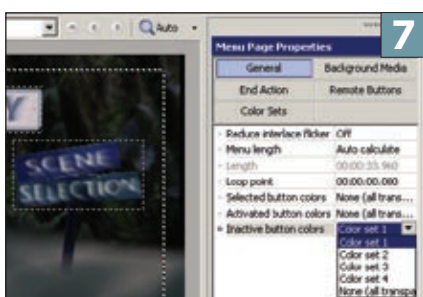
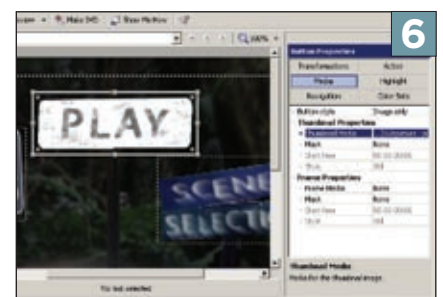
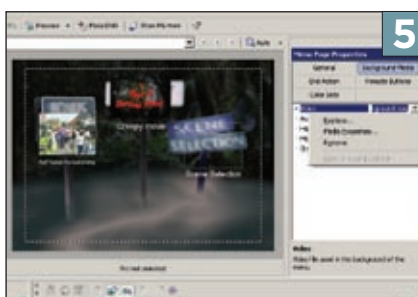
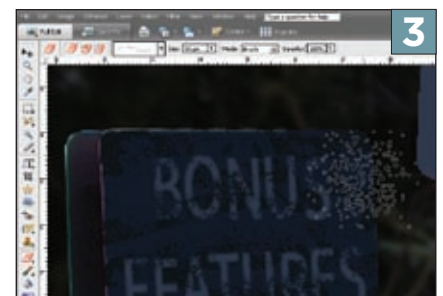
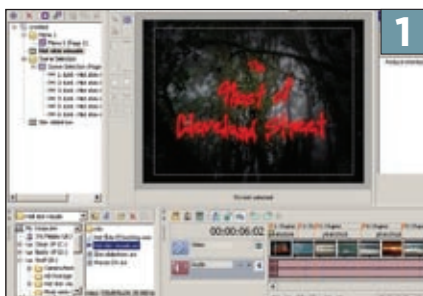
image as a highlight mask, with white, light grey and dark grey corresponding to the three colours you'll be choosing in the next step. Repeat this step for each button in your menu.

7 At the moment only the selected button will be highlighted, but we want the two unselected buttons to be highlighted with subdued colours. To do this, click on the menu background and select the General tab in the Properties panel. Change the entries for Selected button colors to None (all transparent). Change Inactive button colors to Color Set 1.

Click on the Color Sets tab, expand Color Set 1 and adjust colours 1, 2 and 3 to sombre tones, increasing the Alpha (transparency) value of each one to 100%. Keep the colours fairly similar to each other, to make the block colour effect less obvious. Leave colour 4 at 0%, fully transparent.

8 Our signposts bubble up into position at the start of our background animation (in the same colours we've used for our subdued highlights). However, the actual DVD buttons have static positions, so we need to disable them until the signposts have reached their final position. This is done by adjusting the loop point. Click on the timeline at the bottom right of the screen and locate the point at which the buttons settle in their stationary position, then drag the green marker from the start of the timeline to this point. Select the End Action tab in the Properties panel and under Command, select Loop.

9 Preview your project by clicking on the arrow to the right of the Preview button and selecting Preview Disc. If you're happy with the results, close the Preview window, click Make DVD and follow the wizard to burn it to DVD.



DESIGNING YOUR DISCS

Armed with this knowledge of disc construction, you can create DVD-Videos that break away from the template-based designs of most home-made discs. The walkthrough on page 146 explains how to use button highlights to obscure inactive buttons rather than drawing attention to the selected one, getting around the crude appearance of button highlights. This technique is also perfect for scene-selection menus made of animated thumbnail clips; instead of highlighting the selected clip with a garish block-colour rectangle, you can dim the non-selected clips.

Another way to create more interesting-looking buttons is by using the auto-activate feature. Let's imagine we want a menu with three animated buttons. The menu is designed in video-editing software, complete with buttons. Three video files are then produced, each one highlighting a different button. The highlighting style needn't be the traditional block-coloured blob; it could have a glowing, pulsating effect, a shift in camera focus or an animation that dances around the screen. These three videos are imported into authoring software as three separate menus, and a single button is added to each one that links to the highlighted destination.

Each menu is then linked to the other two menus with buttons that auto-activate. By doing so, when the user presses the remote control navigation buttons they will jump to different menu pages. However, as long as the design is consistent, it will appear to be a single menu (except without the usual constraints of button design). The functional buttons will need to be made invisible so as not to upset the design; in DVD Architect Studio, remove the Thumbnail Media and set the Highlight Style to Custom, None. The only downside to this technique is that DVD players take around a second to load a menu, which will make the trio of menus seem sluggish compared to a conventional single menu.

There are plenty of other advanced projects to try that are a little easier to execute. The ability to specify which button is highlighted by default when arriving at a menu is particularly useful for helping users keep track of what they have watched. Imagine a menu page with buttons linked to six titles. The end action for the first title could be to return to the menu and highlight the second button; at the end of the second title, the third button is highlighted and so on. This helps the user view the disc's contents in order with minimal effort, but still allows them to explore freely if they prefer.

You might want to create animated transitions between menus and titles or other menus, which is a popular technique among Hollywood DVD producers. Design the animation in video-editing software and use it as the background to its own menu. Give the menu a single, invisible button that links to your ultimate destination and automatically activates at the end of the menu playback. All you need to do then is make the button in your main menu link to this transition menu rather than directly to the title.

There are lots of other tricks with which to experiment, but with the information in this feature, you no longer need to watch commercial DVDs and lament that they look more interesting than your own. Instead, you can pick apart the underlying techniques and try them for yourself.

Finding your way around DVD navigation

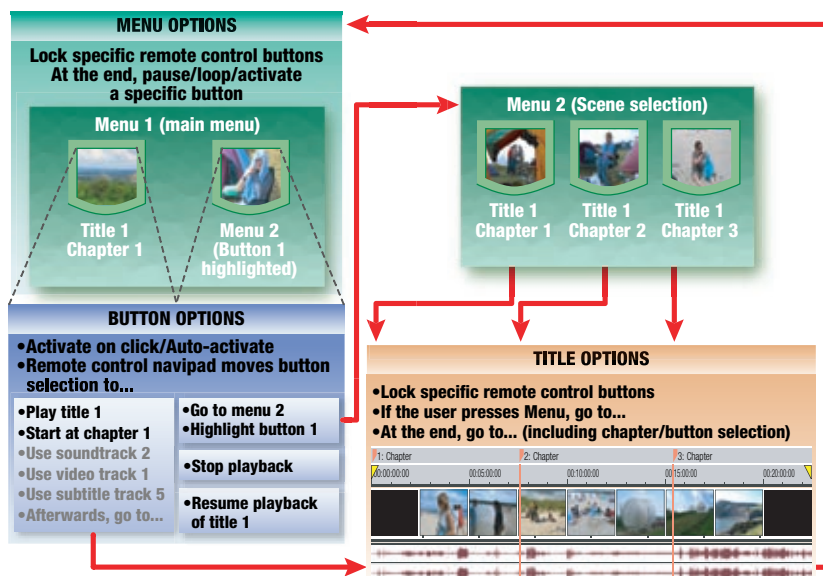
Nearly all DVD-authoring software tries to make assumptions about how menus and videos (known as titles) join together, but more advanced software also lets you customise how and where links are used.

The range of navigation options can be bewildering, but things start to seem simpler once they're broken down into three categories: menu options, button options

and title options. The diagram below shows the navigation layout for a simple DVD structure with just one title, a main menu and a scene-selection menu.

The options aren't an exhaustive list, but those in black are all available in Sony DVD Architect Studio. The options in grey are found in more expensive authoring packages.

DVD NAVIGATION OPTIONS



▲ Navigation options dictate how the different parts of your DVD join together. Some options are set for each video (known as a title), some for each menu and some for each button within a menu. There are four types of button, telling the player either to jump to a different menu, jump to a title, stop playback or resume playing a title from where it left off

It's an enigma Encoding for DVD

Most DVD-authoring software accepts video files in a range of resolutions and formats, converting them to MPEG2 when you finalise and burn your DVD project. DVDs made for Europe conform to the PAL standard of 720x576 pixels per frame at 25 frames per second (fps). European DV cameras adhere to the same standard, so the chances are your video files won't need to be resized. If they do, authoring software can do this automatically. PAL widescreen uses the same 720x576 resolution as non-widescreen PAL, but each pixel is stretched to create a wider aspect ratio. However, make sure widescreen footage is recognised correctly by your authoring software. You can do this in DVD Architect Studio in the Optimise DVD dialog box, available from the File menu.

A single-layer DVD has a 4.38GB capacity (using the 1GB=1,024MB rule; when using 1GB=1 billion bytes, the capacity is 4.7GB). The maximum bit rate of a DVD-Video is 9.1Mbit/s for video and audio. This gives a running time of 65 minutes, perhaps losing a minute or so for the menus and system files. If you want more than 65 minutes of video on a disc, you'll need to use either dual-layer discs – which have a 118-minute running time at maximum quality – or drop the bit

rate. Doing so reduces video quality, but in practice bit rates as low as 4Mbit/s can look acceptable depending on the source material. Fast-moving or noisy video is harder for the MPEG2 algorithm to compress, so will benefit more from higher bit rates.

One way to keep video quality high is to use a more efficient audio format. Most authoring software encodes audio in PCM format, which is uncompressed and runs at a 1.5Mbit/s bit rate. Dolby Digital, also known as AC3, is associated with surround sound, but essentially it's just a compression format, much like MP3. Using stereo AC3 reduces the bandwidth required for your audio to around 0.2Mbit/s, freeing up more bandwidth and/or capacity for video.

The choice of encoder can have an impact on quality, too. Digital video aficionados can argue for hours about the relative merits of different MPEG2-encoding algorithms, but it's generally accepted that two-pass, variable bit rate (VBR) encoding gives better results than single-pass, constant bit rate (CBR). Two-pass encoding analyses the source video content before deciding the best way to distribute the available capacity, using a higher bit rate for fast-moving and complex scenes.